

Application No. 10/034,848
Filed: December 26, 2001
Group Art Unit: 1762

REMARKS

Claims 1-13 have been rejected under 35 U.S.C. § 103(a) over Leluan et al. (6,001,419) or Robin-Brosse et al. (6,410,088). Reconsideration and withdrawal of these rejections is respectfully requested for the following reasons.

Claim 1 recites a method for densifying porous substrates by chemical vapor infiltration using a reactive gas containing at least one gaseous precursor for the matrix material. The reactive gas is both heated after it has entered into the oven, upstream from the loading zone of the substrates, and is preheated prior to entering the oven so that, upon entering into the oven, the reactive gas is brought to an intermediate temperature between ambient temperature and the temperature to which the substrates are heated.

Leluan relates to chemical vapor infiltration, but contains no disclosure, teaching, or suggestion of preheating the reactive gas prior to entering the oven and then heating the reactive gas in the oven upstream of a loading zone containing substrates. Accordingly, a *prima facie* case of obviousness has not been made out, and claim 1 and the claims dependent therefrom are believed to be patentable over Leluan.

Similarly, Robin-Brosse relates to chemical vapor infiltration of porous structures, but contains no disclosure,

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teaching, or suggestion of preheating the reactive gas prior to entering the oven and then heating the reactive gas in the oven upstream of a loading zone containing the porous structures. Accordingly, a *prima facie* case of obviousness has not been made out, and claim 1 and the claims dependent therefrom are believed to be patentable over Robin-Brosse.

Furthermore, dependent claims 2-7 relate to steps of modifying the reactive gas prior to entering the oven, which have non-trivial operational effects. For example, preheating the gas to a temperature no greater than 600°C avoids soot deposits in the gas feed pipe 62, increasing potential processing productivity. (See, e.g., Applicants' specification, page 9, line 28, to page 11, line 14) Neither Leluan nor Robin-Brosse contain any disclosure relating to modifying the gas prior to entering the oven. Note also that claim 5 relates to passing the reactive gas through a heat exchanger prior to entering the oven, not to a specific temperature or pressure as the Examiner states. Therefor these claims are believed to be patentable for this reason as well.

Claims 1-13 have been rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-6 of U.S. Patent No. 5,738,908 (Rey et al.). Reconsideration of this rejection is respectfully requested.

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The Examiner asserts that the elimination of the temperatures and pressures claimed in Rey is an obvious variation. However, independent claim 1 of the present invention recites heating a reactive gas after it has entered into the oven, upstream from the loading zone of the substrates, as well as preheating the reactive gas prior to entering the oven. Rey discloses and claims a CVI method in which a reaction gas is heated as it enters the infiltration chamber. Referring to Figs. 1 and 2, perforated plates 46 in the chamber 30 perform this heating function. There is, however, no disclosure or claim in Rey of preheating the gas prior to entering the chamber, as in the presently claimed invention. Thus, claim 1 and the claims dependent therefrom are believed to be patentable over Rey.

Claims 1-13 have been rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-14 of U.S. Patent No. 5,789,026 (Delperier et al.). Reconsideration of this rejection is respectfully requested.

The Examiner asserts that the elimination of the recited materials claimed in Delperier is an obvious variation. However, as with Rey, Delperier does not disclose or claim the preheating of a gas prior to entering the enclosure 12, as in the presently claimed invention. Thus, claim 1 and the claims dependent therefrom are believed to be patentable over Delperier also.

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The title and abstract have been amended to reflect the claimed method of the present invention, as requested by the Examiner. The specification and claim 1 have been amended to correct obvious grammatical errors.

In view of the above amendments and remarks, claims 1-13 are believed to be in condition for allowance, and reconsideration and indication thereof are respectfully requested. The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite prosecution of the present application.

Respectfully submitted,

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